

WINDOWS 2000 PROFESSIONAL DISASTER RECOVERY AND PROTECTION

After reading this chapter and completing the exercises, you will be able to:

- ◆ Define IntelliMirror technology and describe its key features
- ◆ Back up data and settings on Windows 2000 Professional
- ◆ Recover a Windows 2000 Professional client's applications and data
- ◆ Create and use an Emergency Repair Disk
- ◆ Install and use the Recovery Console
- ◆ Describe remote operating system installation and how it can be used with IntelliMirror to recover an entire PC remotely

Disaster recovery involves minimizing the amount of time a computer is non-functional in the event of a disaster. The causes of a disaster can range from corrupt system files to a hardware failure. Windows 2000 includes several disaster recovery features that can be used in those cases. However, to minimize the chances of such a loss, Microsoft IntelliMirror technologies and built-in backup mechanisms are available. With the use of IntelliMirror, as well as new and enhanced disaster protection and recovery options, Windows 2000 Professional users and system administrators can rest assured that their information and configurations are backed up and ready to be restored at a moment's notice. This chapter discusses IntelliMirror and backup technologies, as well as various disaster recovery methods, including remote OS installation.

MICROSOFT INTELLIMIRROR

IntelliMirror is a term used to describe features of Windows 2000 that help ensure the availability of a user's data and computer configuration. The following list includes its three key elements and explains how each relates to disaster protection and recovery:

- *User data management:* Data backup
- *User settings management:* PC configuration recovery
- *Software installation and maintenance:* Application installation and repair

IntelliMirror greatly reduces the need for and cost of administrative intervention. Therefore, it plays a crucial role in both disaster protection and disaster recovery. If, for any reason, a user loses data or deletes required operating system or application files, that information can be recovered easily, sometimes seamlessly, with minimal or no interaction from an administrator. At the same time, the administrative group also has central administration capabilities so that it can centrally manage users' machines. Therefore, both end users and the administrative team benefit.

Data Backup

As users work at various computers on a network or take their computers home, IntelliMirror can manage their documents and data for them. If users' machines crash, or if they are unexpectedly away from their computer, they will still have access to the information they need. Using the user data management feature of IntelliMirror also means that if a user's data is corrupted on one machine, it can be restored, using the copy of the data on the network.

IntelliMirror technologies in Windows 2000 enable users to easily store and synchronize their data in a specified network location. **Folder redirection** can be done seamlessly via the use of a group policy, or a user can manually set this up. Typically, a user's My Documents folder or other important data folders will be redirected to a share on a Windows 2000 Server on the network. In this case, when a user saves a document to the My Documents folder, it will automatically be saved both on the local machine and on the network share, if the user is on the network. If the user is not on the network, the document will only be saved to the user's hard drive. This process is part of the new offline files feature of Windows 2000, and is discussed in detail in Chapter 9. Then, when the user joins the network again, the local version of the document will automatically synchronize with the network version (see Hands-on Project 15-1). If the network version of the document has also been modified during that time, the user will be prompted as to whether to overwrite the local version, overwrite the network version of the document, or save both copies of the document. Synchronization of data between a local machine and a network share is demonstrated in Figure 15-1. To manually synchronize a file or folder when a user rejoins the network, he or she can highlight the file or folder to be synchronized in Windows Explorer. Then, the user must select Synchronize from the Tools menu, and the synchronization process takes place.

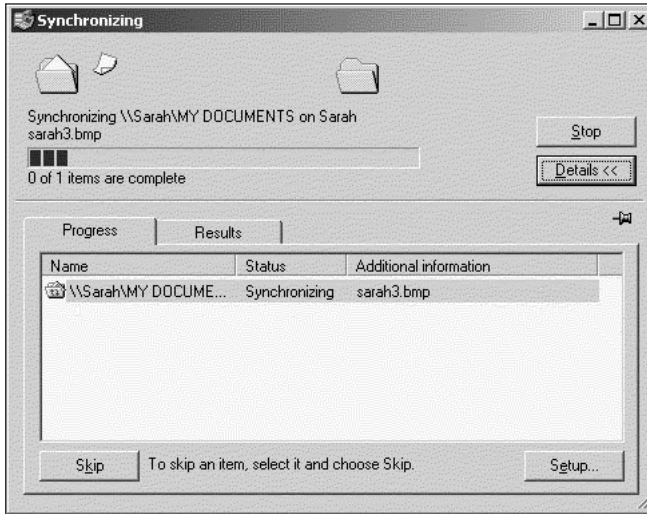


Figure 15-1 Making a file available offline

If one of the copies unexpectedly becomes corrupt or is missing, it will automatically be restored from the existing version of the document. This recovery is transparent to the user.



Administrators will need to consider the cost of hardware and maintenance of the servers that back up user data. A network's bandwidth could also be affected by the synchronization of users' data; that is, the synchronization process can increase network traffic, thus slowing down the network.

PC Configuration Recovery

As with user profiles in Windows NT 4.0, personalized machine settings can be accessed by Windows 2000 Professional users from whatever machine they use on the network, through the user settings management feature of IntelliMirror. Therefore, if a user's machine crashes or is unavailable, his or her workstation configuration can be easily installed onto a new machine. Personalized settings are customizations of the operating system and applications, including language settings, desktop schemes, and custom dictionaries, and are provided to users when they log on to the system, regardless of which physical computer they use.

Application Installation and Repair

Users may also encounter circumstances in which they need to restore applications they have installed. If users inadvertently remove essential application or system files, or if their systems crash, they can use the software installation and maintenance feature of IntelliMirror to rebuild their machines with the same applications they had previously. By using the **Windows Installer Service (WIS)**, they can reinstall their applications and repair applications seamlessly

(see Hands-on Project 15-2 to change or remove an application using WIS via the Control Panel). Restorable applications include software, software upgrades, and even operating system upgrades.



Windows Installer can also be used to create a software package for end users. Review Windows 2000 Help and the *Windows 2000 Resource Kit* for additional details.

MICROSOFT BACKUP UTILITY

Microsoft IntelliMirror technologies are quite beneficial in the area of backing up user data, applications, and personalized settings, using network shares and policies. However, there are also methods of backing up a PC by using external tools, such as:

- Tape drives
- External hard disks
- Zip or Jaz drives
- Recordable CD-ROM drives
- Logical drives

The **Backup utility** in Windows 2000 provides the easiest method of backing up data onto any one of these media or onto a server on a network (see Hands-on Project 15-3). The Windows 2000 Backup utility can be used for backing up and restoring data and the system configuration. There are three options within Backup:

- Back up programs and files
- Restore programs and files
- Create an **Emergency Repair Disk (ERD)**, a disk that contains configuration information about your PC, which is used to restore a PC if Windows will not start or the system files are corrupt or missing (try Hands-on Project 15-4).

Figure 15-2 shows the initial view of Backup. Using this tool is a good precautionary element in the disaster recovery process. The restore and repair options will be discussed later in this chapter.

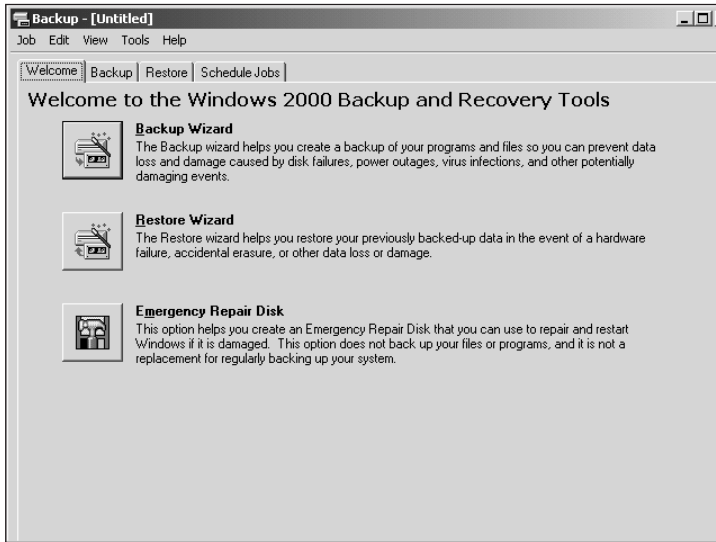


Figure 15-2 Windows 2000 Backup utility

Using the Backup utility, there are two methods you can use to back up your data. You can use the Backup Wizard, or you can click the Backup tab to manually set your backup options (see Figure 15-3). The Wizard takes you, step by step, through the process of defining and scheduling (if necessary) your backups. Hands-on Project 15-5 provides instructions on using the Backup Wizard to schedule a backup.

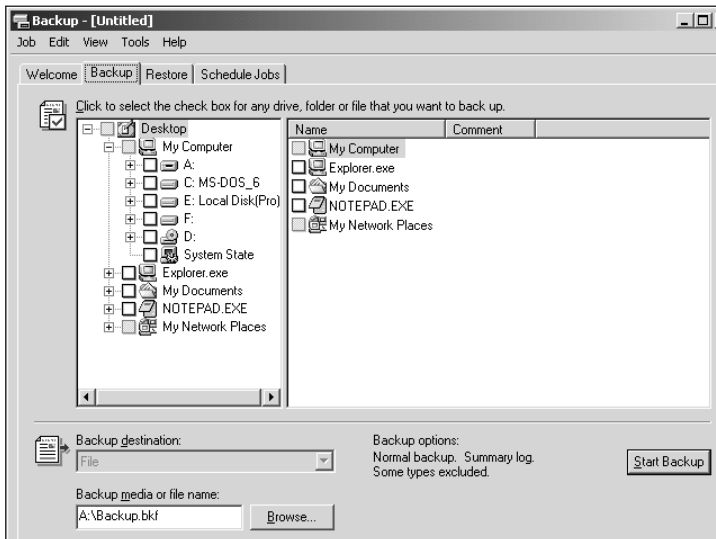


Figure 15-3 The Backup tab of the Windows 2000 Backup utility



You must be an Administrator or a member of the Backup Operators group to back up or restore files using the Backup utility.

To start the Backup utility, choose Start, Programs, Accessories, System Tools, Backup (alternately, you can select Start, Run, and then type *ntbackup* and press Enter). Then, whether you use the wizard or the Backup tab, you will need to choose what to back up:

- Back up everything on the computer
- Back up selected files, drives, or network data
- Only back up the **system state data** (data about the current state and configuration of the operating system)

The first option backs up all the data physically connected to your computer. The second option allows you to choose which directories or drives you want to back up, as shown in Figure 15-4. The third option only backs up the system's boot files, COM settings, and Registry data (see Figure 15-5).

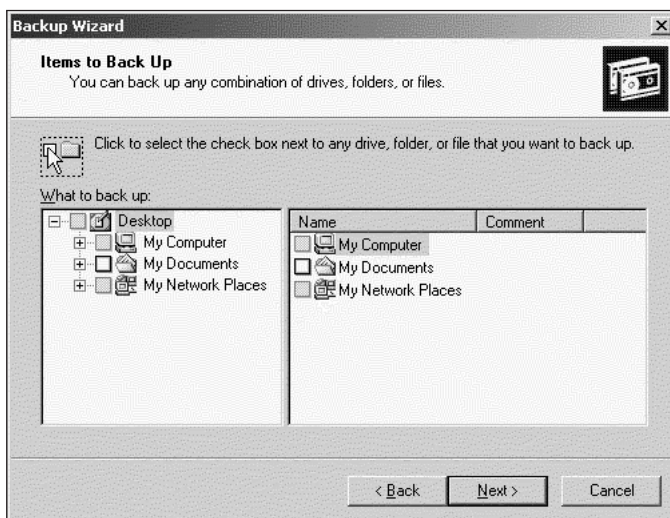


Figure 15-4 List of items to back up, using the Backup utility

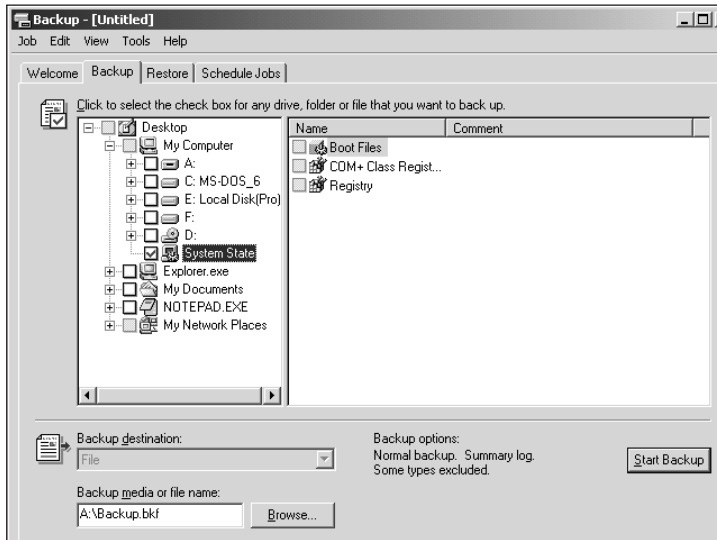


Figure 15-5 Selecting to back up system state data

In addition to choosing what to back up, you can also specify the **backup type**:

- **Copy backup:** Backs up all selected files but does not mark them as being backed up
- **Normal (or full) backup:** Backs up all selected files and marks them as being backed up
- **Daily backup:** Backs up only the selected files that have been created or modified the day that the backup is being performed but does not mark the files as being backed up
- **Differential backup:** Backs up only the selected files that have been created or modified since the last full backup, but does not mark the files as being backed up
- **Incremental backup:** Backs up only the selected files that have been created or modified since the last normal or incremental backup and marks the files as being backed up



When you use the Backup Wizard and choose either “Back up everything” or “Back up selected files,” the backup type defaults to Normal or Incremental, respectively. You can change the backup type from the Completing Backup Wizard screen by clicking the Advanced button.

As previously mentioned, the third option, backing up the system state data, provides a way to back up the Registry, the COM+ Class Registration database, and system boot files. By backing up these files, you can restore your PC’s configuration to its original state if necessary. Figure 15-6 shows the system state backup process at work.

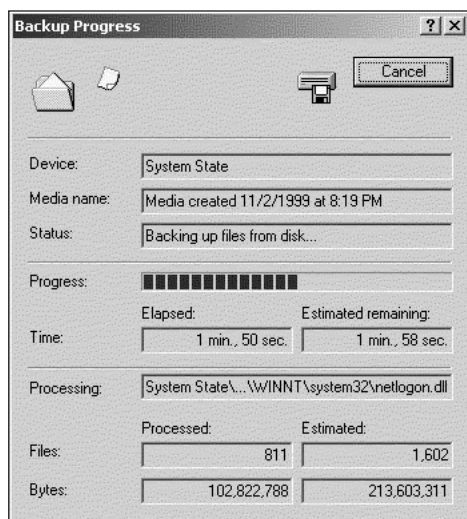


Figure 15-6 Backing up system data



When the system state data is backed up, a copy of your Registry files (default, SAM, security, software, and system) is also saved in the `\Winnt\Repair\Regback` directory. Advanced users can use these files to restore their Registry files manually without restoring the entire system state. (See Chapter 13 for more information on working with the Registry.)

REPAIRING WINDOWS 2000 PROFESSIONAL

Disaster protection is important, but when catastrophe occurs, you'll need to be prepared. If system files become corrupt or are accidentally deleted, or if certain drivers or services are keeping the operating system from loading, you have several options for repairing or restoring your PC:

- Safe Mode (discussed in Chapter 14)
- Recovery Console
- Emergency repair process
- Remote OS installation

These options (except for Safe Mode) are discussed in the following sections.

Recovery Console

Expert users and system administrators may want to utilize the Windows 2000 **Recovery Console** for more precise control over the troubleshooting and repair process (see Hands-on Projects 15-6 and 15-7). If you know which services or drivers may be causing the problem,

instead of running the PC in Safe Mode, you can simply use the Recovery Console to disable those specific services or drivers. You can also use the Recovery Console to repair a corrupted Master Boot Record or to copy needed files from a floppy disk, CD-ROM, or a network share to your PC.

You can access the Recovery Console in one of two ways:

- From a command prompt, change directories to your Windows 2000 CD. Run `\i386\winnt32.exe /cmdcons` to install the Recovery Console. When you reboot your machine, you'll notice a new option for starting Windows 2000 Professional with the Recovery Console.
- Use the Windows 2000 CD or startup disks to start your computer. Select the Recovery Console option when you are prompted to choose repair options.

When the Recovery Console opens, you must specify the Windows 2000 client you want to log on to, then you must log on as the Administrator. Table 15-1 lists the commands available from the Recovery Console. To view the command-line parameters and uses for each of these commands, see "Recovery Console commands" in the Windows 2000 Professional online Help.

Table 15-1 Recovery Console Options

Command	Description
attrib	Changes the attributes of a file or directory
batch	Executes the commands specified in a text file
chdir (cd)	Changes directories or displays the current directory name
chkdsk	Checks and reports on the status of the disk
cls	Windows 2000 starts while logging all of the drivers and services that were and were not loaded during the boot process
copy	Copies files
delete (del)	Deletes files
dir	Displays the directory structure
disable	Disables a service or driver
diskpart	Manages partitions
enable	Enables or starts a service or driver
exit	Exits the Recovery Console and restarts the computer
expand	Extracts files from compressed files
fixboot	Writes a new partition boot sector onto the system partition
fixmbr	Repairs the Master Boot Record
format	Formats a disk
help	Displays a list of commands available in the Recovery Console
listsvc	Lists the services available
logon	Logs on to Windows 2000
map	Displays the drive letter mappings

Table 15-1 Recovery Console Options (continued)

Command	Description
mkdir (md)	Creates a new folder
more	Displays a text file
rmdir (rd)	Deletes a folder
rename (ren)	Renames a file
set	Displays and sets console environment variables
systemroot	Sets the current folder to the Systemroot folder

Emergency Repair Process

If your problem is caused by corrupt or missing system files, your startup environment, or your partition boot sector, you may want to use the emergency repair process. As with Windows NT 4.0, Windows 2000 lets you create an Emergency Repair Disk (ERD) for repairing your system (see Hands-on Project 15-4). To use the ERD to fully recover your system and return it to its last functional state, you must have created this disk before the system crashed. You can run the emergency repair process without the disk, but all of your personalized settings and updates will most likely need to be reinstalled.

To use the ERD, you will need to reboot your machine with the Windows 2000 Setup disks or the Windows 2000 Professional CD. During Setup, you will be asked if you would like to install Windows 2000. Press Enter to start the installation process. Then you will be prompted as to whether you want to reinstall Windows 2000 or repair an existing version of Windows 2000. Press R to repair Windows 2000. Press R again to repair your system using the emergency repair process. You'll then have two options for repairing Windows 2000:

- *Fast repair*: Requires no user interaction; automatically attempts to repair problems related to the Registry, system files, the boot volume, and your startup environment
- *Manual repair*: Enables the user to choose to repair to the Registry, system files, the boot volume, or startup environment

You can then start the repair process, using the ERD if you have one. If the emergency repair process is successful, the PC will automatically reboot, and everything should be in working order again. As a last resort, if the emergency repair process cannot repair the system, you may want to consider reinstalling Windows 2000. However, this method is time-consuming, and you may need to reinstall many of your applications and upgrades.

Remote OS Installation

Administrators can also enable **remote OS installation**, which can be used along with the Microsoft IntelliMirror technologies to recover an entire PC, including a user's data, individual configurations, and applications. Remote OS installation is a component of the optional Windows 2000 Server **Remote Installation Services (RIS)** (see Chapter 2), which allows

a user to remotely rebuild the computer's entire image across the network. No on-site technical support is necessary, so this cuts down on administrative costs and minimizes the downtime of the user's machine.

Client computers that can participate in a remote OS installation must have a **PXE (Pre-boot Execution)** remote boot ROM. Network PCs and computers that comply with an industry-standard hardware guide called PC98 will have this. If the computer does not have the PXE remote boot ROM, then an RIS remote boot disk can be used along with a supported PCI-based network interface card (NIC). These client machines must also use a DHCP (Dynamic Host Configuration Protocol) server on the network.

When a user starts a client with either the PXE remote boot ROM or an RIS remote boot disk, the client can request an installation of Windows 2000 Professional from a remote RIS server. The server will, in turn, provide one of the following types of installations:

- *CD-based:* Similar to installing the OS with a CD, but the source files are on another machine (the RIS server) on the network
- *Remote Installation Preparation (RIPrep) desktop image:* After installing Windows 2000 Professional, installing applications, and making configuration changes on one workstation, an administrator clones the image of that machine and replicates it to an RIS server. The entire **Remote Installation Preparation (RIPrep)** image can then be deployed to other workstations with remote OS installation.

Once the images are on the RIS server, it can be used to install those images to any client that is remote-boot enabled. A user can initiate a network service boot by pressing the F12 key when booting up, at which time the RIS server will install the Client Installation Wizard. This wizard uses Group Policies to give the user a list of available installation options from Active Directory. If the user has only one installation option available, the user will simply be prompted with a confirmation screen, and the installation will begin. Otherwise, the four installation options are:

- *Automatic Setup:* Prompts the user with a list of OS options if there is one, then an unattended installation begins
- *Custom Setup:* Allows the user to specify the computer name and the location where the computer account will reside in Active Directory
- *Restart a Previous Setup Attempt:* Restarts the remote OS installation process if a previous installation attempt failed
- *Maintenance and Troubleshooting:* Provides the user with access to third-party maintenance, pre-OS installation maintenance, and troubleshooting tools

CHAPTER SUMMARY

- IntelliMirror consists of a set of features within Windows 2000 that utilizes policies, folder redirection, and the Windows Installer Service (WIS) for backing up and restoring users' data, personalized settings, and applications. There are a number of methods for backing up and restoring a client PC by using user and group policies, Windows Installer, and folder redirection.
- Windows 2000 includes built-in backup features. You should thoroughly understand the Backup utility and how it can be used to back up and restore a PC.
- You can use the emergency repair process to create and use an Emergency Repair Disk (ERD) to repair a system that has failed.
- You can install and use the Recovery Console to recover user settings in the event of a system failure.
- You can use the Remote Installation Services (RIS) for a complete remote system restoration.

KEY TERMS

backup type — A backup configuration that determines how often data is backed up and the way old and new files should be handled. The types of backups are copy, daily, differential, incremental, and normal.

Backup utility — A tool that enables users to back up and restore their data and system configurations in case of a hardware or software failure.

copy backup — A method of backing up all selected files without marking them as being backed up.

daily backup — A method of backing up only the selected files that have been created or modified on the day that the backup is being performed. They are not marked as being backed up.

differential backup — A method of backing up selected files that have been created or modified since the last full backup. They are not marked as being backed up.

Emergency Repair Disk (ERD) — A disk that contains configuration information about your PC. It can be used to restore a PC if Windows will not start or the system files are corrupt or missing.

folder redirection — A component of IntelliMirror technologies that uses group policies to place specified user folders on a share on the network.

incremental backup — A method of backing up selected files that have been created or modified since the last normal or incremental backup. These files are marked as being backed up.

IntelliMirror — A set of features within Windows 2000 that utilizes policies, folder redirection, and the Windows Installer Service (WIS) for backing up and restoring users' data, personalized settings, and applications.

- normal (or full) backup** — A method of backing up all selected files and marking them as being backed up.
- PXE (Pre-boot Execution)** — A standard environment in PC98-compliant computers and network computers that can be used for a remote OS installation.
- Recovery Console** — A command-line interface that provides administrative tools useful for recovering a system that is not booting correctly.
- remote OS installation** — A component of Remote Installation Services (RIS) that can install Windows 2000 Professional on remote-boot-enabled PCs across a network.
- Remote Installation Services (RIS)** — An optional service in Windows 2000 Server that works with various other services to enable remote installations, including a remote operating system installation.
- Remote Installation Preparation (RIPrep)** — A type of installation used with remote OS installation whereby an administrator can take an entire image of one Windows 2000 Professional machine and install that image onto other workstations.
- system state data** — A collection of system-specific data that can be backed up and restored using the Windows 2000 Backup utility.
- Windows Installer Service (WIS)** — A Windows 2000 component that manages the installation and removal of applications by applying a set of centrally defined setup rules during the installation process.

REVIEW QUESTIONS

- Which of the following types of media can be used to back up a user's data? (Choose all that apply.)
 - tape drives
 - external hard drives
 - logical drives
 - network shares
- The Recovery Console can be used to stop and start services. True or False?
- Which of the following could *not* participate in remote OS installation?
 - a network computer with no RIS remote boot disk
 - a PC with a PXE-based remote boot ROM, but with no RIS remote boot disk
 - a PC with an RIS remote boot disk, but with no PXE-based remote boot ROM
 - an undocked laptop with an RIS remote boot disk
- Which of the following backup types backs up only the selected files that have been created or modified since the last normal or incremental backup? (Choose all that apply.)
 - normal
 - daily
 - differential
 - incremental

5. Which of the following tools can you use to create an Emergency Repair Disk?
 - a. Add/Remove Programs applet in the Control Panel
 - b. Backup utility
 - c. Disk Manager
 - d. Disk Cleanup
6. Which of the following boot options is used to send debugging information from one computer to another computer on the network?
 - a. Last Known Good Configuration
 - b. Safe Mode with networking
 - c. Enable boot logging
 - d. Debugging Mode
7. John has offline folders set up to synchronize with his machine, and he is currently not connected to the network. John is working on a file that he will need to synchronize with the network version when he logs on to the network. Unknown to him, Libby has just updated the network version of that same document. When John logs on to the network, what will happen when he tries to synchronize his local files with the network version of the files?
 - a. John's file will overwrite Libby's version.
 - b. Libby's version will overwrite John's version.
 - c. John will be prompted as to whether he wants to update the network version or his local version.
 - d. John's version and Libby's version will merge into a combined document.
8. Which of the following IntelliMirror technologies is associated with recovering a user's personal desktop settings?
 - a. user data management
 - b. software installation
 - c. user setting management
 - d. user desktop management
9. Which of the following items are backed up when backing up the system state data, using the Backup utility? (Choose all that apply.)
 - a. COM+ Class Registration database
 - b. Registry files
 - c. system boot files
 - d. the \Winnt\System32 directory
10. Folder redirection is set up using the Synchronization Manager. True or False?
11. When the _____ repair option is run, the system automatically attempts to repair problems related to the Registry, system files, the boot volume, and the startup environment.

12. Which of the following backup types marks backed up files as being backed up? (Choose all that apply.)
 - a. copy
 - b. daily
 - c. differential
 - d. incremental
 - e. normal
13. Which of the following users can use the Backup utility to back up secured files on a Windows 2000 Professional computer? (Choose all that apply.)
 - a. a member of the Administrators group
 - b. a member of the Backup Operators group
 - c. any user that has Log On Locally rights
 - d. a member of the Backup utility group
14. When the system state data is backed up, a copy of the Registry files is copied into the _____ directory.
15. A Windows 2000 ERD is used in which of the following?
 - a. Recovery Console
 - b. emergency repair process, Fast Repair
 - c. full backup
 - d. Registry restore process using Regedit
16. You can install the Recovery Console by using the Winnt32.exe program on the Windows 2000 CD with the _____ switch.
17. If you wanted to use the Emergency Repair Disk (ERD), which of the following could you use to boot your machine? (Choose all that apply.)
 - a. Windows 2000 CD
 - b. Windows 2000 Setup disks
 - c. an Emergency Repair Disk
 - d. a system boot disk
18. You can use the Recovery Console to create an Emergency Repair Disk. True or False?
19. _____ can be used along with IntelliMirror technologies to recover an entire PC's image.
20. You need to create an Emergency Repair Disk to perform the emergency repair process. True or False?
21. In order to use the Remote Installation Services (RIS), a machine must be a DHCP client. True or False?

22. Which of the following are types of installations that an RIS server can offer a client?
 - a. client-based
 - b. RIPrep desktop image
 - c. CD-based
 - d. network-based
23. A user can initiate a network service boot by pressing the _____ key when booting up.
24. Which of the following tools does an RIS server install first on a client PC that is requesting a remote OS installation?
 - a. Recovery Console
 - b. Client Installation Wizard
 - c. Windows 2000 Professional
 - d. PXE Remote Boot ROM
25. Which of the following setup options can an RIS server provide for a remote OS installation via the Client Installation Wizard? (Choose all that apply.)
 - a. Automatic Setup
 - b. Custom Setup
 - c. Restart a Previous Setup Attempt
 - d. Maintenance and Troubleshooting

HANDS-ON PROJECTS



Project 15-1

To enable your files to be synchronized with the network's copy of your files when you log off:

1. Open Synchronization Manager (**Start, Programs, Accessories, Windows Explorer, Tools, Synchronize**).
2. Click **Setup**, then click the **Logon/Logoff** tab (see Figure 15-7).

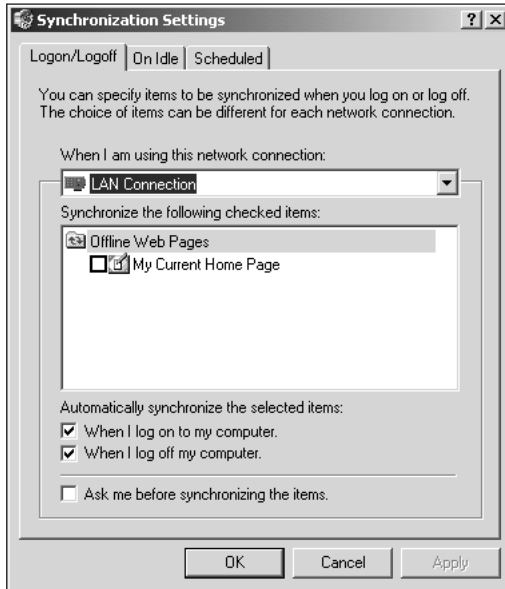


Figure 15-7 Synchronization Manager Setup, Logon/Logoff tab

3. In the **When I am using this network connection** list, select the network connection you want to use.
4. In the **Synchronize the following checked items** list, select the files or folders you want to synchronize when you log on to and log off the network.
5. Under **Automatically synchronize the selected items**, select both **When I log on to my computer** and **When I log off my computer**.
6. Click **OK** to close the Synchronization Settings dialog box.



Project 15-2

To install packages using the Windows Installer packages:

1. Open the **Control Panel** (Start, Settings, Control Panel).
2. Double-click **Add/Remove Programs**.
3. Depending on whether you want to change an application or remove it, click the **Change** or **Remove** button.
4. Follow the prompts to make the necessary changes.
5. Close any open dialog boxes or windows and the Add/Remove Programs applet. You may also need to restart your computer if prompted.



Project 15-3

To back up the contents of your **My Documents** folder using the **Windows Backup** utility:

1. Choose **Start, Programs, Accessories, System Tools, Backup**.
2. Click the **Backup** tab.
3. Check the box next to **My Documents**. Notice that a gray check box automatically appears next to the drive containing **My Documents** and that the check boxes next to each of the subdirectories under **My Documents** are automatically checked.
4. In the bottom-left corner, change path in the **Backup media or file name** field to **c:\backup.bkf** (see Figure 15-8).

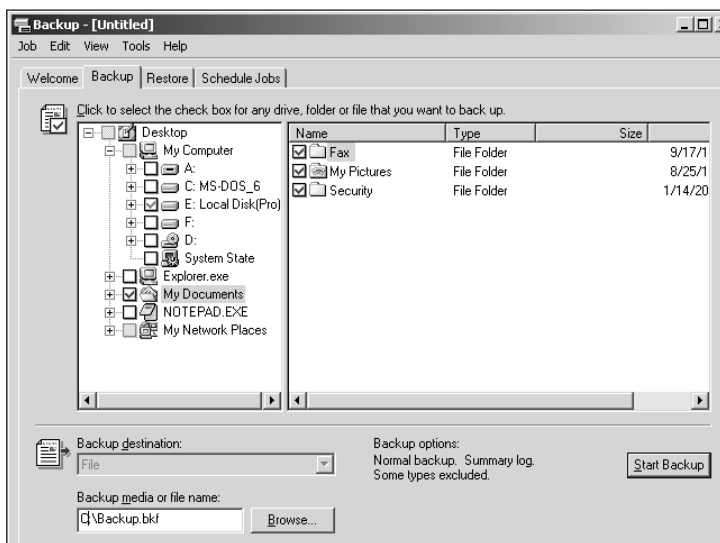


Figure 15-8 Backing up **My Documents** and specifying the backup location

5. Look over your options, then click **Start Backup**.
6. When the backup is complete, close the Backup utility.



Project 15-4

To create an **Emergency Repair Disk**:

1. Open the Backup utility (**Start, Programs, Accessories, System Tools, Backup**).
2. Click **Emergency Repair Disk**.
3. You will be prompted to insert a floppy disk into drive A. Check the box to also back up the Registry (see Figure 15-9). Then insert a blank formatted disk into drive A. Click **OK**.



Figure 15-9 Creating an Emergency Repair Disk

4. When the files are finished copying, click **OK**.
5. Close the Backup utility.



Project 15-5

To schedule a backup of your My Documents folder, using the Windows Backup utility:

1. Choose **Start, Programs, Accessories, System Tools, Backup**.
2. Click the **Backup Wizard** button.
3. Windows will display a Welcome screen. Click **Next**.
4. At the next screen, select the **Back up selected files, drives, or network data** radio button (see Figure 15-10). Click **Next**.

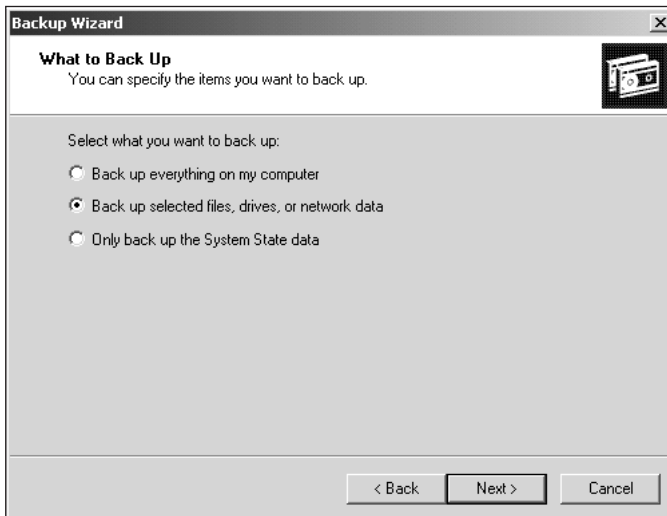


Figure 15-10 Backing up selected files, drives, or network data

5. Select the items to be backed up (refer to Figure 15-4). Click **Next**.
6. In the **Backup media or file name** field, change the path to **c:\backup.bkf**. Click **Next**.

7. On the Completing the Backup Wizard page, click the **Advanced** button, and select **Incremental** from the list (see Figure 15-11). Click **Next**.

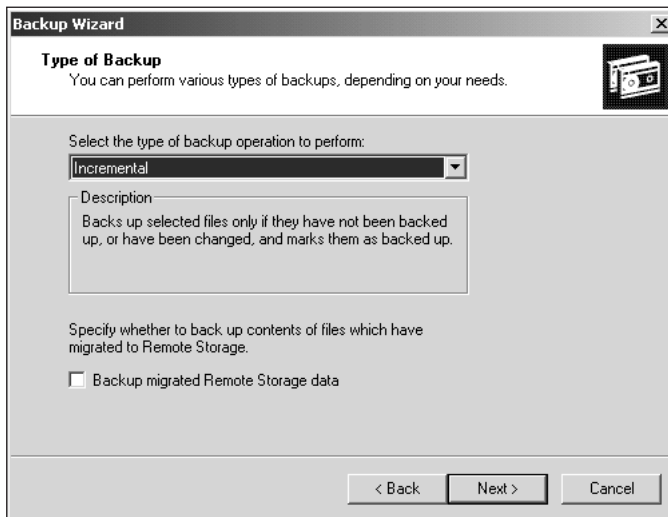


Figure 15-11 Selecting Incremental backups

8. Read through your verification and compression options, then click **Next**.
9. Under **If the archive media already contains backups**, select **Replace the data on the media with this backup**. Notice that the option at the bottom is no longer dimmed. Check the check box so that only the owner and administrators can access the backups (see Figure 15-12). Click **Next**.

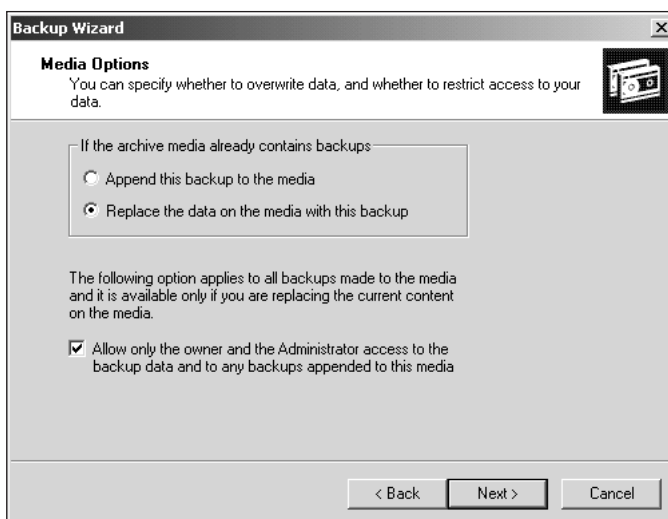


Figure 15-12 Selecting media options

10. Accept the default labels. Click **Next**.
11. In the **When to Back Up** dialog box, choose **Later**. When prompted for your account information, enter a username and password of an Administrator or Backup Operator. Click **OK**.
12. In the **Job name** field, type **Daily Backup of My Documents**. Then click **Set Schedule**.
13. Under **Schedule Task**, choose **Daily** from the drop-down list and set the start time (see Figure 15-13).

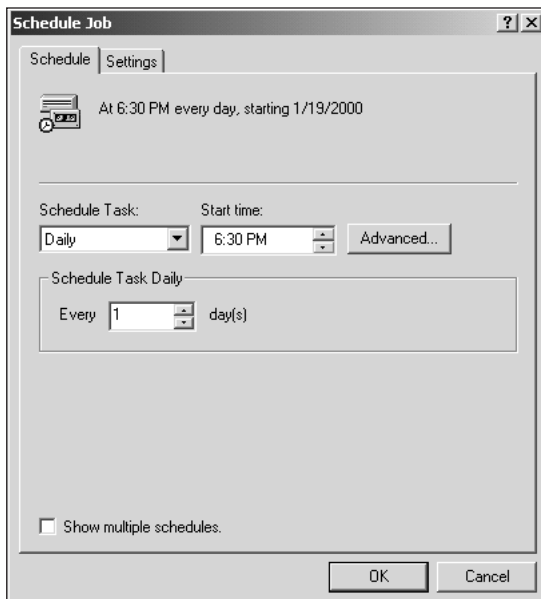


Figure 15-13 Scheduling a backup

14. Click the **Settings** tab to review your options, but accept the defaults. Click **OK** to continue. Then click **Next**.
15. Review your settings, and click **Finish** to schedule the backup.
16. Close the Backup utility.



Project 15-6

To install the Recovery Console:

1. From a Command Prompt (**Start, Programs, Accessories, Command Prompt**), browse to the i386 folder of a Windows 2000 Professional CD.
2. Run **winnt32 /cmdcons**.
3. You will be prompted by a Windows 2000 Setup dialog box explaining how to use the Recovery Console (see Figure 15-14). Click **Yes** to install it.



Figure 15-14 Setting up the Windows 2000 Recovery Console

4. The necessary files will be copied to your system. When finished, click **OK**.
5. Choose **Start, Shutdown**. Choose **Restart** from the menu, and click **OK**.
6. When prompted, choose **Microsoft Windows 2000 Recovery Console** from the list of available operating systems.
7. You will be prompted for which operating system you'd like to log on to. Type the number for your operating system, and press **Enter**.
8. You will then be prompted for the local administrator password. Type that in, and press **Enter**.
9. Type **help** at the command prompt for a list of commands that you can use in the Recovery Console.
10. Type **exit** at the command prompt to exit and restart Windows. This time, choose your Windows 2000 operating system to boot up.



Project 15-7

To uninstall the Recovery Console:

1. Double-click **My Computer**. Choose **Tools, Folder Options**. Then click the **View** tab.
2. Click **Show hidden files and folders**, and then clear the **Hide protected operating system files check box** (see Figure 15-15). Click **OK**.
3. Browse to the root directory, and delete the **\Cmdcons** folder and the file called **Cmldr**.
4. On your computer's boot disk, locate the **Boot.ini** file, right-click it, select **Properties**, and deselect the **Read-only** check box and click **OK**.

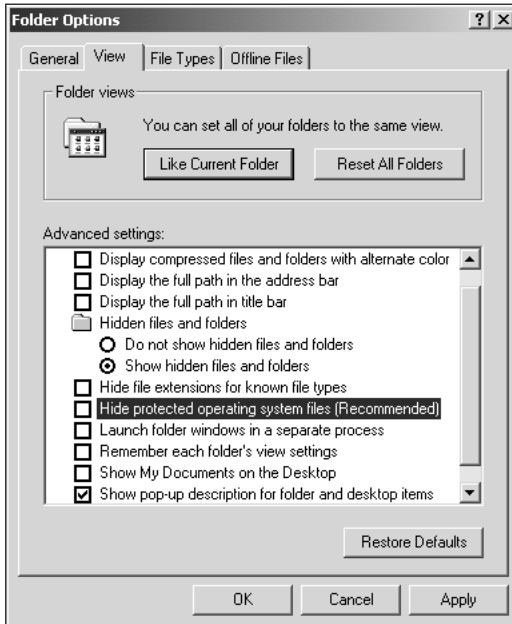


Figure 15-15 Setting advanced file and folder settings



Before continuing, copy your `Boot.ini` file and rename the copy `Boot.bak`. You can use this file later if the `Boot.ini` file should become damaged. Be extra careful with the next step to make sure that you delete only the line for the Recovery Console. An incorrect `Boot.ini` file could keep your computer from restarting.

5. Using Notepad (**Start, Programs, Accessories, Notepad**), open the **Boot.ini** file in the root directory. Remove the entry for the Recovery Console. For example, you would need to delete the last line in the following sample `Boot.ini` file:

```
[boot loader]
timeout=10
default=multi(0)disk(0)rdisk(0)partition(1)\WINNT
[operating systems]
C:\="Microsoft Windows"
multi(0)disk(0)rdisk(0)partition(1)\WINNT="Microsoft Windows
2000 Professional" /fastdetect
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows 2000 Recovery
Console" /cmdcons
```

6. Save the file and close it.
7. Close any open windows.

CASE PROJECTS



1. You're in charge of backing up all of your organization's data stored on Windows 2000 Professional machines. Your organization consists of 2500 users, and 500 of those users usually dial in from home. All of your users use Windows 2000 Professional. Which of the following backup methods will you use across your organization? Choose all that apply, and justify your choice(s).
 - a. tape backups
 - b. Zip drives
 - c. folder redirection
 - d. remote OS installation
2. Describe the three key features of IntelliMirror, and describe a scenario for each feature that explains how that feature reduces the total cost of ownership (TCO).
3. Describe a situation in which it would make more sense to use the Recovery Console than the emergency repair process.